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<p>(21) International Application Number: PCT/IB96/01089</p> <p>(22) International Filing Date: 14 October 1996 (14.10.96)</p> <p>(30) Priority Data: 08/543,636 16 October 1995 (16.10.95) US</p> <p>(71) Applicant: BABN TECHNOLOGIES CORP. [CA/CA]; 3000 de l'Assomption Boulevard, Montreal, Quebec H1N 3V5 (CA).</p> <p>(72) Inventor: ROYER, Alain; 1089 Des Tourterelles, Longueuil, Quebec J4G 2A9 (CA).</p>		<p>(81) Designated States: AL, AM, AT, AU, AZ, BB, BG, BR, BY, CA, CH, CN, CZ, DE, DK, EE, ES, FI, GB, GE, HU, IS, JP, KE, KG, KP, KR, KZ, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, TJ, TM, TR, TT, UA, UG, UZ, VN, ARIPO patent (KE, LS, MW, SD, SZ, UG), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, ML, MR, NE, SN, TD, TG).</p> <p>Published With international search report.</p>
<p>(54) Title: PRINTED DOCUMENT INCLUDING BAR CODE AUTHENTICATION SYSTEM</p> <p>(57) Abstract</p> <p>A printed document in which a bar code is imprinted on a surface thereof and entirely covered with a scratch-off layer, the removal of the scratch-off layer reveals the entire bar code thereby enabling easy authentication of the printed document.</p> <div data-bbox="787 1144 1323 1470"><p>The diagram shows a 3D perspective of a rectangular printed document. On its top surface, there is a rectangular area (20) containing a bar code (24). A thin, transparent scratch-off layer (26) is partially removed from this area, revealing the bar code underneath. A small rectangular block (22) is shown being lifted from the surface, having just removed a portion of the scratch-off layer. The bar code consists of several vertical lines of varying heights.</p></div>		

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**PRINTED DOCUMENT INCLUDING BAR
CODE AUTHENTICATION SYSTEM**

FIELD OF THE INVENTION

5 The present invention is directed to a printed document in which a bar code is printed on the document and the bar code is entirely covered by a scratch-off layer. When the scratch-off layer is removed, the bar code may be scanned to thereby authenticate the printed document.

BACKGROUND OF THE INVENTION

10 State and local lotteries have become important fund raising events for the sponsoring agency. The popularity of lotteries has soared in the 1980's and continues to grow.

15 Those agencies charged with the administration of lotteries are acutely aware of the need to maintain the integrity of the lottery system from the printing of lottery tickets to the validation of prize winning number. Accordingly, much effort has been made to ensure that all tickets are authentic. It is generally recognized that in order for a lottery game to be successful, from the point of view of both the purchaser and the sponsor, the lottery ticket must be secure against counterfeiting, forgery and/or alteration.

20 Scratch-off type lottery tickets are those having at least one area over printed with an opaque latex ink. When the latex ink dries it forms a protective coating that can be scratched off to reveal pre-printed game data indicating whether or not a prize has been won.

One method of authenticating a lottery ticket is to print a bar code on the bottom side thereof. When a person claims a prize by rubbing the scratch-off layer to reveal the

winning of a prize, the retail store owner can authenticate the ticket by reading the exposed bar code on the bottom side of the ticket with a scanner or other suitable device.

Bar codes currently used on lottery tickets suffer from two major disadvantages. First, the bar codes are generally one dimensional and are comprised of at least 10 and sometimes as many as 43 or more characters to be printed on the lottery ticket. The number of characters occupies a great deal of space on scratch-off lottery tickets which are typically only 4" long and 2" wide. It is because the typical bar code takes up a large amount of space on the lottery ticket, that the bar code has been printed only on the bottom side or non-game data side of the lottery ticket.

In the early 1990's there was developed a new type of bar coding system incorporating a two-dimensional bar code. The first of these systems is known as a stacked bar code in which several lines of a bar code are stacked one on top of the other. This type of bar code can be read by a laser bar-code scanner, a camera or a scanner such as those used in validation terminals. There has also been developed a two-dimensional matrix bar code comprised of dots and spaces in a two-dimensional matrix. Two dimensional bar codes enable a greater number of symbols to be set forth in a smaller area.

It would be a significant advance in the art of protecting printed documents including lottery tickets from counterfeiting if a bar code system could be employed for authenticating the printed document. A significant advantage would be obtained if the entire bar code could be hidden from view until such time as authentication is necessary. Such a system would make it more difficult to counterfeit the printed document and when the printed document was a lottery ticket provide a more secure lottery system.

It would also be a significant advantage to the overall appearance of the lottery ticket if the area occupied by the bar code authentication system could be reduced so that more of the substrate area of the printed document could be used for other purposes, such as artwork in conjunction with lottery tickets.

SUMMARY OF THE INVENTION

The present invention is directed to the authentication of printed documents and especially lottery tickets. The printed document is provided with a bar code covered by a scratch-off layer which is placed over the entire bar code. The bar code is therefore hidden from view until the scratch-off layer is removed. In one embodiment of the invention, the bar code is covered by a scratch-off layer which is removed only by authorized personnel. Therefore, in accordance with one aspect of the invention, tampering with the scratch-off layer itself at least raises a question as to whether the printed document is authentic.

In another embodiment of the invention, the bar code is imprinted in the same area occupied by the game data which together are covered by a scratch-off layer. In this embodiment the purchaser of the lottery ticket is permitted to remove the scratch-off layer. Authentication of the ticket is then made by scanning the exposed bar code.

In accordance with another aspect of the invention, the area occupied by the bar code can be minimized so that the location of the bar code is not restricted. Thus, the bar code and accompanying scratch-off layer can be either on the back of the ticket or on the front of the ticket. In the past, bar codes were limited to the back of the ticket because they occupied a relatively large area, thereby severely hampering the imprinting of game data, art work and other information on the front of the ticket.

In particular, the present invention is directed to a printed document such as a lottery ticket comprising:

- (a) a substrate;
- (b) bar code authentication means imprinted on the substrate; and
- (c) a scratch-off layer placed over the entire bar code authentication means and adapted to be removed to reveal the bar code authentication means so that the printed document can be authenticated.

The present invention also concerns a method for authenticating a printed document in which the scratch-off layer is removed to reveal the entire bar code authentication means. The bar code authentication means can be read and compared with a predetermined list of bar code identification means in the form of numbers and/or symbols such that if the bar code identification means appears on the predetermined list, the printed document is authentic. If the bar code is spaced apart from the game data and covered with a separate scratch-off layer, then removal of the scratch-off layer itself constitutes a mode of authentication of the lottery ticket.

BRIEF DESCRIPTION OF THE DRAWINGS

10 The following drawings in which like reference characters indicated like parts are illustrative of embodiments of the invention and are not intended to limit the invention as encompassed by the claims forming part of the application.

Figure 1 is a perspective view of the bottom side of a printed document in the form of a lottery ticket employing a bar code in accordance with the prior art;

15 Figure 2 is a perspective view of one embodiment of a lottery ticket with a bar code covered by a scratch-off layer in accordance with the present invention;

Figure 3 is a perspective view of another embodiment of the invention in the form of a lottery ticket with a scratch-off layer covering a bar code which is separated from another scratch-off layer covering game data; and

20 Figure 4 is a perspective view of a further embodiment of the invention in the form of a lottery ticket with a bar code and game data covered by a single scratch-off layer.

DETAILED DESCRIPTION OF THE INVENTION

The present invention is generally directed to printed documents which have a bar code authentication means completely covered by a scratch-off layer. Because the bar code is not exposed to the public, counterfeiting and tampering with the bar code is prevented or at least inhibited.

Bar codes have been previously used to authenticate lottery tickets. Referring to Figure 1 there is shown a prior art lottery ticket 2 shown with its bottom side 4 facing upwards. The surface 4 contains instructional material generally designated by the numeral 6 for the ticket and a bar code display 8 containing a plurality of symbols such as bars 10 and spaces 12 capable of identifying an authentic ticket. As shown in the prior art ticket of Figure 1, the bar code is always exposed, from the time it is sold to the time it is presented to a lottery sponsor for authentication. Because the lottery ticket is exposed, a counterfeiter may alter the bar code or attach a new bar code for the purposes of collecting a prize on a counterfeit lottery ticket.

In accordance with the present invention, a bar code is used for authentication purposes but, unlike prior art devices, the entire bar code is covered with a scratch-off layer. The bar code may be covered by a separate scratch-off layer or by the same scratch-off layer used to cover the game data. Only when the scratch-off layer is removed is the bar code revealed. In the case of separate scratch-off layers, the lottery sponsor may scrutinize any ticket that is presented for collection if the scratch-off layer has been altered or removed. If a single scratch-off layer is used, any attempt to alter the bar code will likely result in an effect on the game data which will also likely be scrutinized by a lottery sponsor.

Referring specifically to Figure 2 there is shown a printed document 20 in the form of a lottery ticket in accordance with the present invention which has a bar code 22 imprinted on a surface 24 of the printed document. It will be understood that the surface

24 of the printed document 20 may be the top side or the bottom side of the printed document.

The bar code 22 is covered in its entirety by a scratch-off layer 26. Accordingly, when the printed document (lottery ticket) is sold, the bar code can not be seen by the purchaser of the lottery ticket. It is only when the scratch-off layer is removed by the lottery sponsor that the bar code becomes visible and can be read by an optical scanner or the like. If the bar code is presented with the scratch-off layer removed, the sponsor may reject the ticket. Thus, it is the absence of removal or alteration of the scratch-off layer which itself assists in determining whether a lottery ticket is authentic.

The bar code and its overlaying scratch-off layer can be printed on the front side of the lottery ticket along with the game data which is covered by a separate scratch-off layer. Referring to Figure 3, there is shown a lottery ticket 30 having a top side 32 having imprinted thereon game data represented by numeral 34 and a bar code 36. Each of the game data 34 and bar code 36 are covered by separate scratch-off layers 38 and 40, respectively.

In this embodiment of the invention, the bar code remains hidden until the scratch-off layer is removed by a lottery sponsor to reveal the bar code. The bar code is then read by a scanner and if it is a member of a predetermined list, then the lottery ticket is authenticated. Counterfeiting by replacement or alteration of the bar code is determined because in order to engage in such activity the scratch-off layer would have to be removed.

In another embodiment of the invention, a single scratch-off layer covers both the game data and the bar code. Referring to Figure 4 there is shown a printed document 50 in the form of a lottery ticket having a top side 52 having imprinted thereon game data 54 and a bar code 56, each covered by a single scratch-off layer 58.

The game data bar code may be printed anywhere in the designated area covered by the scratch-off layer so long as each can be read by the human eye and an optical scanner or the like, respectively. Thus, the game data 54 can be imprinted around the bar code as shown specifically in Figure 4 or superimposed thereon. All that is required is that the purchaser of the ticket be able to read the game data to see if a prize has been won. Of course, the lottery sponsor must be able to read the bar code to authenticate the lottery ticket.

The type of bar codes that can be used in the present invention is unlimited. Both one dimensional bar codes and two dimensional bar codes can be used. Two dimension bar codes are preferred because they provide the greatest number of symbols in the smallest area. Examples of one dimensional bar codes include the Universal Product Code (UPC), Code 39, interleaved 2 of 5 Code, Code 93 and Code 128. Examples of two dimensional bar codes are the stacked bar code containing several lines of bar code stacked one upon the other. Examples include Code 16K, Code 49, MLC-D2 and Code PDF417.

Another two dimensional bar code comprises a matrix code comprised of dots and spaces in a two dimensional matrix. Examples of two dimensional matrix codes are Code one, Vericode Code and Data Matrix Code.

WHAT IS CLAIMED:

1. A printed document comprising:
 - (a) a substrate;
 - (b) bar code authentication means imprinted on the substrate; and
 - 5 (c) a first scratch-off layer placed over the entire bar code authentication means and adapted to be removed to reveal the bar code authentication means so that the printed document can be validated.
2. The printed document of claim 1 wherein the bar code authentication means comprises a plurality of symbols confirming that the printed document is authentic.
- 10 3. The printed document of claim 1 further comprising game data imaged on a portion of the substrate which when exposed determines if a prize has been won.
4. The printed document of claim 3 further comprising a second scratch-off layer covering the game data and adapted to be removed by the user to reveal the game data.
- 15 5. The printed document of claim 4 wherein the bar code and first scratch-off layer are both on the same side of the substrate as the game data and second scratch-off layer.
6. The printed document of claim 1 further comprising game data, said first scratch-off layer covering both the bar code and the game data.
7. The printed document of claim 6 wherein the game data is printed around the bar
20 code.
8. The printed document of claim 6 wherein the game data and bar code are superimposed one over the other.

9. The printed document of claim 1 wherein the bar code is a two dimensional bar code.

10. The printed document of claim 3 wherein the game data and the bar code authentication means are on different portions of the substrate.

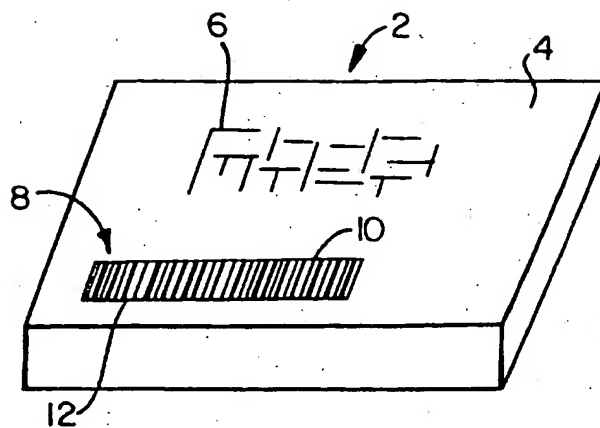
5 11. A lottery ticket comprising:

- (a) a substrate;
- (b) bar code authentication means imprinted on a first portion of the substrate;
- (c) game data imaged on a second portion of the substrate;
- (d) a first scratch-off layer covering the entire bar code authentication means;
- 10 and
- (e) a second scratch-off layer covering the game data.

12. A method of authenticating a printed document, said printed document comprising:

- (a) a substrate;
- (b) bar code authentication means imprinted on the substrate; and
- 15 (c) a first scratch-off layer placed over the entire bar code authentication means, said method comprising removing the first scratch-off layer to reveal the entire bar code identification means, reading the bar code identification means and comparing the same with a predetermined list of bar codes such that if the bar code identification means appears on the predetermined list,
- 20 the printed document is authentic.

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(PRIOR ART)

FIG. 1

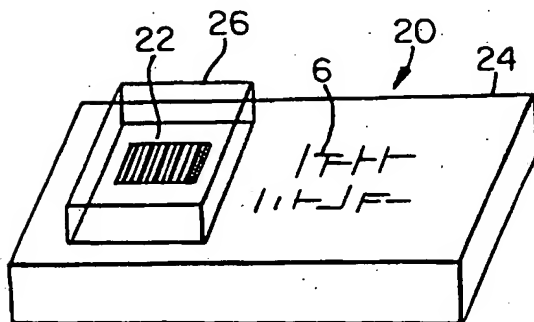


FIG. 2

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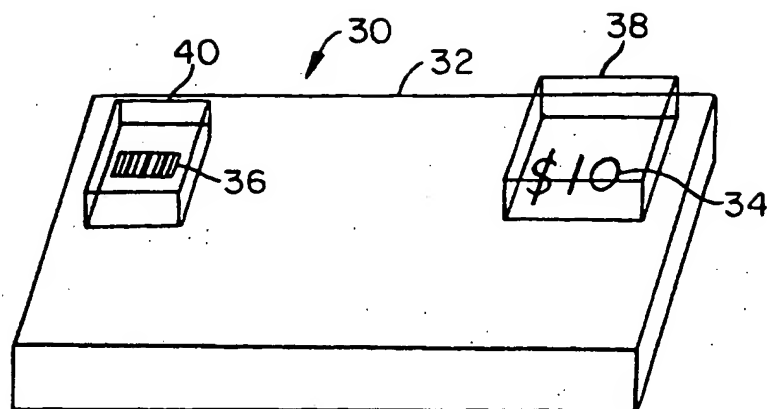


FIG. 3

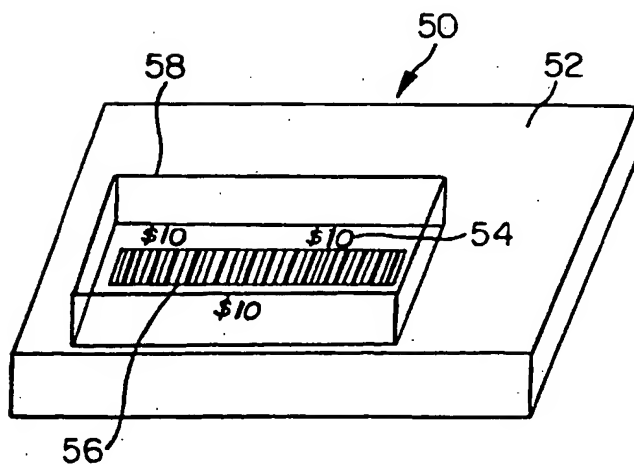


FIG. 4

INTERNATIONAL SEARCH REPORT

In ional Application No
PCT/IB 96/01089

A. CLASSIFICATION OF SUBJECT MATTER
IPC 6 A63F3/06

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 6 A63F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	EP,A,0 665 036 (BOUEDEC) 2 August 1995 see column 4, line 40 - line 56 ---	1,11,12
A	US,A,5 074 566 (DESBIEENS) 24 December 1991 see column 5, line 54 - line 61 ---	1,11,12
A	EP,A,0 668 092 (WATSON) 23 August 1995 see page 2, line 36 - line 39 ---	1,11,12
A	US,A,4 793 061 (RIZZO ET AL.) 27 December 1988 see column 2, line 14 - line 18 ---	1
A	EP,A,0 565 108 (3M) 13 October 1993 see example 5 ---	1
A	US,A,4 775 155 (LEES) 4 October 1988 see claim 5 -----	1

☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

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- "&" document member of the same patent family

Date of the actual completion of the international search

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INTERNATIONAL SEARCH REPORT

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Patent document cited in search report	Publication date	Patent family member(s)	Publication date
EP-A-665036	02-08-95	FR-A- 2715576	04-08-95
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		AU-A- 3526493	14-10-93
		CA-A- 2091868	11-10-93
		JP-A- 6122267	06-05-94
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